



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/740,819	12/21/2000	Jin-Ru Chen	3641-0110P	6565

2292 7590 04/19/2005

BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

POLLACK, MELVIN H

ART UNIT	PAPER NUMBER
----------	--------------

2145

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/740,819

Applicant(s)

CHEN ET AL.

Examiner

Melvin H Pollack

Art Unit

2145

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/21/00, 5/31/01.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: see attached office action.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hunter et al. (6,223,172) in view of Calvignac et al. (6,785,278).
3. For claim 1, Hunter teaches (abstract; col. 1, line 1 – col. 3, line 15) a lookup engine (Fig. 4, #250) for a network device (Fig. 2, #200; col. 4, lines 40-65), comprising the steps of:
 - a. A parser (Fig. 2, #210; esp. Fig. 2, #230) for getting address information of an incoming packet (col. 5, lines 15-60);
 - b. A generator system (Fig. 5, #525) for generating an Identity Independent Distribution (I.I.D.) hash index for said incoming packet (col. 7, lines 40-50) in response to said address information of said incoming packet (col. 7, line 64 – col. 8, line 20); and
 - c. A selector (Fig. 2, #290) for selecting an I.I.D. hash index from said generator system (Fig. 6, #610; “search keys”), and said selected I.I.D. hash index causes an address table (Fig. 6, #630) to output forwarding information for said incoming packet (col. 5, lines 45-60).
4. Hunter does not expressly disclose a generator system comprising a predetermined number of shift control logic each for generating/selecting hash index, but does disclose masking techniques to develop index information (col. 10, lines 20-45). Calvignac teaches a method

Art Unit: 2145

(abstract) of packet routing (Fig. 1) by hashing address values (col. 1, line 1 – col. 4, line 1) using a predetermined number of shift control logic (col. 9, lines 45-65). At the time the invention was made, one of ordinary skill in the art would have added shift logic to Hunter in order to reduce collisions for address distributions (col. 3, lines 50-65).

5. For claims 2 and 12, Hunter teaches a central process unit for processing said incoming packet when said I.I.D. hash indexes find no hit in said address table (Fig. 6, #660).

6. For claims 3 and 11, Hunter teaches that said network address is a destination MAC address (col. 5, line 56).

7. For claims 4 and 10, Hunter teaches that said network address is a destination IP address (Fig. 6, line 64).

8. For claims 5 and 9, Hunter teaches that said network address is a flow address (col. 5, lines 10-15).

9. For claim 6, Hunter does not expressly disclose that said shift control logic comprises a shift register having a plurality of segments for shifting said plurality of segments in response to a predetermined key number, and means for performing XOR operations on said plurality of segments. Calvignac teaches the division and XOR operations (Fig. 2) using preselected permutations (col. 9, lines 45-65). At the time the invention was made, one of ordinary skill in the art would have added this shifting ability to Hunter in order to handle multiple hash values (col. 9, lines 45-50).

10. For claim 7, Hunter teaches a method for generating lookup information for a network device, comprising the steps shown in claim 1, but does not expressly disclose partition and shifting. Calvignac teaches the steps of:

Art Unit: 2145

- a. Partitioning said network address of m bits into a plurality of segments S_i each having n bits, $0 \leq i < \left\lceil \frac{m}{n} \right\rceil - 1$ (Fig. 2, #202);
 - b. Generating an I.I.D. hash index by performing XOR operation on a segment S_{base} and a segment S_{extend} , (Fig. 2, #210) where said segment S_{base} is formed by performing XOR operation on each of said plurality of segments, and said segment S_{extend} is formed by Rotating S_0 a number of bits determined by a predetermined key number (col. 6, line 15 – col. 7, line 35).
11. At the time the invention was made, one of ordinary skill in the art would have used the partitioning method of Calvignac in order to improve upon the simple XORing of Hunter's masking system (col. 7, lines 10-20).
 12. For claim 8, Hunter does not expressly disclose obtaining said segment $S_{\left\lceil \frac{m}{n} \right\rceil}$ to have the same length with said segment S_0 by filling binary zeroes. Calvignac expresses this limitation (Fig. 2, #200). At the time the invention was made, one of ordinary skill in the art would have used the partitioning method of Calvignac in order to improve upon the simple XORing of Hunter's masking system (col. 7, lines 10-20).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
14. Address forwarding through hash indexing and shift logic: Egbert (6,181,702), Merchant et al. (6,816,488), Schnell (5,757,795), Warren (6,690,667).

Art Unit: 2145


15. Address forwarding through hash indexing: Jaffries et al. (6,792,423), Yang et al. (6,424,650).
16. Flow identification through hash indexing: Chaudri et al. (6,275,861), Kloth et al. (6,643,260).
17. Hash indexing background: Bass et al. (6,675,163), Chin (5,852,607), Poole et al. (5,920,900).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin H Pollack whose telephone number is (571) 272-3887. The examiner can normally be reached on 8:00-4:30 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Valencia Martin-Wallace can be reached on (571) 272-6159. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MHP
13 April 2005


VALENCIA MARTIN-WALLACE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700